

<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	10/089,357	SCHWEIKARD ET AL.	
	Examiner	Art Unit	
	Jaworski Francis J.	3737	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Inv.chng 6/1/04;IDS7-22-02.
2. ☒ The allowed claim(s) is/are 1 - 13.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

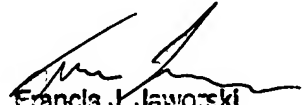
\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☒ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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| <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br/>Paper No./Mail Date <u>7-22-02</u></li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____.</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____.</li> </ol> |
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 Francis J. Jaworski  
 Primary Examiner

### **EXR's AMENDMENT AND REASONS FOR ALLOWANCE**

In view of the papers filed 01 June 2004, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48(a). The inventorship of this application has been changed by addition of Jose-Luis Moctezuma.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows: At the beginning of the specification before line first has been added

-- This application is a 371 pf PCT/EP01/08844 filed July 31, 2001. --

The following is an examiner's statement of reasons for allowance:

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With respect to the claims as amended per preliminary amendment filed March 27, 2002 . the prior art including most relevant of the IDS submissions was considered as follows:

Schlumberger et al (US4899318, of record in the IDS filed July 22, 2002) was directed to reconstruction of an object from two or more backprojection images using a volume determination of all rays which pass through the object and then determining the envelope limit of this volume using distances and determined first and second spaces inside of and outside of the object envelope, without suggestion to streamline this process using a conical surface projection based upon the shape of the reconstructed object.

German Offenlegungsschrift DE 198 07 884 A1, of record with the aforementioned IDS, is directed towards instrument trajectorizing in relation to bone using planar buildup of a tomographic volume reconstruction.

Walterman (US6061469) is directed to simulated X-ray reconstruction using decomposition of the synthetically viewed solid into nested shells.

Yang (US6944259) is directed to cone beam source illumination together with computationally simplified moving frame reconstruction for three-dimensional image reconstruction.

Lampman et al (US5532595) is directed to magnetic resonance imaging using sinusoidal field gradients such that reduced volume (spherical/ellipsoidal/cylindrical) scan regions can be obtained.

Schomberg (US6542573) is directed to reconstructing 3D images from cone beam projection - as opposed to conical surface involvement with backprojection – with determination of pseudo-projection data in an outer rim beyond the sensitive detector surface.

Klotz et al (US6618468) compensates for cone beam cutoff by acquiring projection data in different modes for different examination subzones unrelated to investigated object geometry.

Corby (US5274551) performs fluoroscopic navigation by back-projecting a catheter line contour into a three-dimensional vascular model.

Kuo-Petravic et al (US5375156) used Feldkamp backprojection methods for cone beam 3-D X-ray projection across orthogonal great circles to improve resolution for backprojection reconstruction of an object.

Mori et al (US5475422) proposed three-dimensional reconstruction from plural camera view fields by selecting feature points in a field of view to form a backprojection line which is then projected onto additional images to form epipolar reference backprojection lines for the reconstruction.

Tuy (US5625660) is directed to image reconstruction from cone beam projection data obtained along a spiral helical scan path with a severality of projection views by processing data in rows tangent to the cone vertex in different (untruncated) fashion with respect to detector data orthogonally oriented with respect to the cone vertex.

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Heuscher (US4305127) is directed to small scan circle region of interest back-propagation based upon slope and attenuation values at the edge of the truncated projection region.


None of the prior art alone or in combination teaches or suggests inter alia generating a conical surface in space for every contributing projection image with the cone vertex and directrix for the surface determined by the spatial position of the imaging system and the shape of the directrix determined by the object being visualized or by a defined projection of the object surface, forming the spatial intersection of the conical surfaces to determine a geometric structure, and displaying the representation of structure so derived and using same for navigation, or in conjunction with magnetoresonance imaging with specific application using the spongiosa of bone as the geometric structure with reference to which navigation the representation is being used.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

02-27-2006

  
Francis J. Jaworski  
Primary Examiner